NECESSITY AND OPPORTUNITY: URBAN STORMWATER MANAGEMENT IN ROCKVILLE, MARYLAND

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The City of Rockville, with 50,000 residents and substantial areas of commercial and office development, is located in the Maryland suburbs of Washington, D.C. Rockville began a building boom in the 1940s that continues today (City of Rockville Planning Commission, 2002). The Mayor and City Council encourage residents to take ownership in their local government, and the City prides itself on being responsive to their needs as much as possible. The City government is committed to "enhancing the quality of life in Rockville by providing premium services in response to the needs of everyone who visits, works, and lives in our city", according to the City's mission statement.

Much of Rockville was built prior to stormwater management (SWM) requirements. Many existing stormwater management systems are ineffective or undersized by today's standards. The resulting riparian tree loss, stream erosion, siltation and struggling aquatic species in the City's streams indicate that stormwater management is an ongoing process that continually needs fine-tuning.

Rockville's Department of Public Works (DPW) has 25 years of experience with comprehensive watershed management, beginning with the first SWM ordinance in the State of Maryland. Current City law and regulations, which mirror the State's requirements, provide for stringent water quality and quantity control for new development or redevelopment. They also support a strong public stormwater retrofit and stream restoration program. DPW is challenged with creating practical and effective watershed management plans for existing development in a city that is 87% built out. DPW also must demonstrate to residents that the proposed solutions are achievable, effective, safe, attractive, compatible with many other neighborhood needs, and above all, necessary.

Rockville's Watershed Management Plans

The purpose of the watershed management plans are to make the City's stream corridors environmentally stable and enjoyable for residents, and to mitigate Rockville's nonpoint source effects on downstream conditions in the Potomac River and the Chesapeake Bay. These plans recommend projects for subsequent Capital Improvement Program (CIP) implementation that will make a substantial difference to local stream conditions. To work in Rockville, these need to be politically as well as technically viable. The City's watershed management strategy has evolved into a flexible, opportunistic approach that matches available funding, developers, and complementary projects to needed watershed improvements. The plans also involve stakeholders to an unprecedented degree.

Over the last six years, DPW completed watershed management plan studies for the City's three watersheds, each more detailed and comprehensive than the last (Figure 1). Each had stream inventories of aquatic conditions and an opportunities assessment to identify possible SWM improvements and stream restoration sites, and each resulted in projects now being implemented through the City's CIP. The complexity and controversy of the public process varied greatly, however. Residents often had different opinions about stream problems, solutions and acceptable trade-offs, most notably in the last plan.

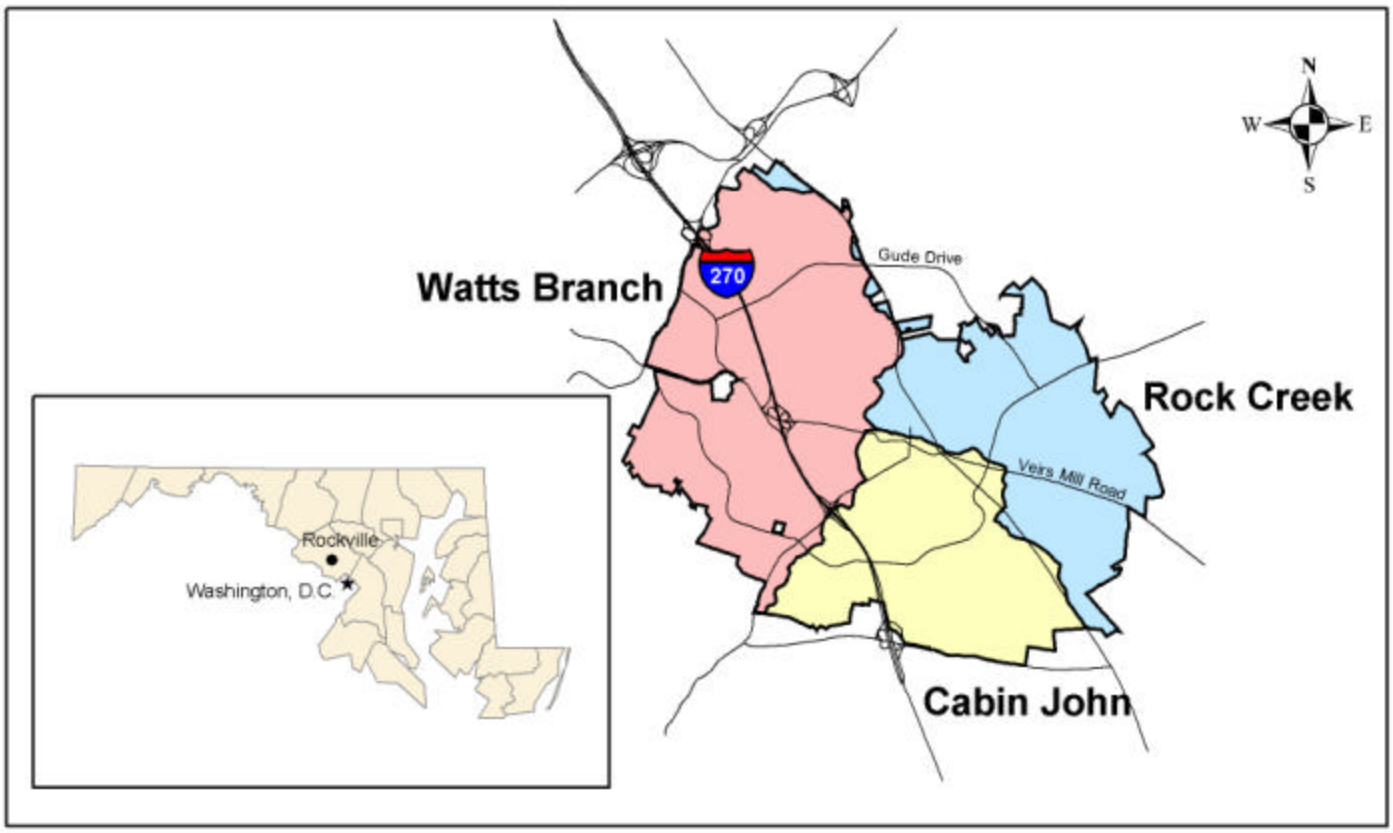

Figure 1. City of Rockville Watersheds

The Watts Branch Watershed Study (Center for Watershed Protection and City of Rockville, 2001) was a lightening rod for controversy. The area had 4,000 acres of residential, office and highway uses, and two major mixed-use developments pending in the headwaters as the study commenced. Vocal residents were protective of their parks and distrustful of the City's environmental judgement in previous projects. To many, the stream problems lay with the newcomers building upstream, not with their own 30-year old developments. Still, they wanted solutions to the acknowledged erosion and water quality problems through Watts Branch Stream Valley Park, the City's largest natural area. Table 1 presents data on the City as a whole and on the Watts Branch.

Table 1. Rockville at a Glance

CITY OF ROCKVILLE FACTS			WATTS BRANCH FACTS	
Size[1]		13.3 mi^2	Drainage Area[1]	5.9 mi^2
Population[2]		47,388	Watershed Imperviousness[4]	28%
Land Use[3]	Residential	73%	Watts Branch Streams[4]	18.7 miles
	Mixed Use	12%	Watts Branch Streams in parkland[4]	7 miles
	Office	7%		
	Industrial	4%		
	Retail	4%		

1: City of Rockville GIS
2: Census 2000
3: City of Rockville Planning Commission, 2002
4: Center for Watershed Protection and City of Rockville, 2001

Essential Public Process

In previous watershed studies, the City began by studying technical issues. Resident involvement came towards the end of the process when there were recommendations to react to. For Watts Branch, the City needed much earlier involvement and better communication.

Before DPW developed the watershed study's scope, it held a public meeting to solicit the residents' watershed and neighborhood concerns. Afterward, staff invited attendees and other stakeholders to join staff for regular meetings to review the study and deal with community concerns about balancing tree loss, appearance, safety and recreation needs against watershed improvements. The City also asked civic associations and developers to send representatives. The resulting Watts Branch Partnership was comprised of residents from across the watershed, City staff from the Recreation and Parks Department, the Planning Department and DPW, and eventually the consultants. The City Manager's Office had recently established the new Project Implementation Coordinator position to manage the public process for all City projects. This person served as a facilitator at Partnership meetings, and focused on keeping discussions within the ground rules and staying on the agenda. Table 2 lists the stakeholders invited to join; business and development interests did not participate, but residents and institutional agencies were very involved.

Table 2. Watts Branch Watershed Stakeholders

Non-agency Stakeholders	Agency Stakeholders
Homeowners Association(s)	Rockville Recreation and Parks Departments
Civic Associations	Rockville Public Works Department
Watts Branch Partnership	Rockville City Forester
Developers (e.g., King and Thomas Farms)	Rockville Environmental Specialist
Watershed Property Owners	State and Federal Regulatory Agencies
Business Interests (industrial, commercial business owners)	Gas, Oil and Utility Companies
Montgomery College	Montgomery County Public Schools
Lakewood Country Club	Rockville Mayor & Council

Center for Watershed Protection and City of Rockville, 2001

The Partnership's first task was to review the scope of the watershed study. Staff incorporated most suggestions, then had a Partnership resident participate in the consultant selection. The Center for Watershed Protection was selected because of their innovative watershed management approach and experience with local governments. The Center teamed with a local engineering firm and an environmental resource assessment firm to augment their staff (primarily in surveying, stream inventory, and some concept designs).

The Partnership met monthly or more often for two and a half years. City staff set agendas for the meetings and the study schedule, and evaluated and summarized technical information and study results for the Partnership. The Partnership's resident members acted as liaisons between their civic associations and the City to convey opinions and explain projects, attended lectures to learn about current SWM and stream protection practices, and reviewed drafts of the study report. Partnership members visited existing City SWM facilities and stream restoration sites to see marshes, bio-engineering and gabions that had been in operation for several years.

They used their new knowledge to evaluate the consultant's analysis and plans. Project details mattered greatly to these members, even seemingly small things. DPW incorporated their advice and comments

wherever feasible, and explained the staff's reasons when we disagreed. This process helped assure the residents that their involvement was productive. It resulted in better integration of important issues for both the residents and the City in the final results, rather than each side losing essential features or issues. It also offered a sense of fairness that is absolutely necessary to belief in good government - even if the residents did not always get what they wanted, they agreed that the study was fair and reasonable.

The City needed residents to support the management plan. It was not only politically difficult to get a controversial set of recommendations adopted, but also complaints of inaccuracies, unresponsiveness and unfairness would cloud unrelated City projects. To demonstrate the City's commitment to working with the residents, staff tried a new process. In 1997, the City had begun training all employees on a new process called Citizen Participation by Objectives (Bleiker, 1995). This process demands that the City convey to all potentially affected interests, or stakeholders, that:

1. There is a serious problem or an important opportunity that must be addressed;
2. The City is the right entity to address it, and that it would be irresponsible for us to ignore it;
3. Our approach is reasonable, sensible and responsible; and
4. We are listening and we care about the costs, the negative effects or the hardships that our actions will cause people.

The Citizen Participation by Objectives approach was time consuming but worthwhile. DPW did not abdicate its responsibility to manage the watershed study or give in on controversial projects. However, staff tried to look at the decision-making process from the residents' point of view as well as from the City's. Sometimes, the staff would argue for a worthy project where the benefits were particularly helpful and the negatives could be overcome or minimized to suit most of the affected people. The Partnership generally saw the same thing and helped design improvements to overcome neighborhood concerns. They advocated the projects and the goals of the Watts Branch study in discussions with their civic associations. This was difficult for some people since they were sometimes viewed as 'selling out', or were caught between displeased neighbors and the City. Nevertheless, the Partnership maintained representation from thirteen out of twenty-one neighborhoods within the watershed. Neighborhoods containing stream valleys or with potential SWM projects tended to participate more. Meetings typically had ten to sixteen residents in attendance.

The Partnership did not vote on decisions. It was explained at the beginning of the study that this would be an effort to uncover opinions and concerns, and to look at all reasonable alternatives within the confines of the study assumptions. The Partnership would seek consensus where possible, but dissent was also acceptable. Staff emphasized that the Mayor and Council were the final arbiters of the management plan recommendations, and that the study would try to fairly present both pros and cons of proposed projects. At most key decision points, after discussion had elicited all viewpoints, the large majority of resident members agreed on their recommendations. Those who held opposing positions seemed satisfied that their concerns would be recorded in the final study to be further evaluated when the individual project moved into final design.

In addition to educating the Partnership members, the City also shared the study with the larger Watts Branch community. The Center for Watershed Protection hosted a charette, which was sponsored by the Partnership, for the public early in the study to present findings of existing conditions. Charette participants tried watershed management activities such as creating an educational campaign and designing SWM for several sites. Staff held a month-long Open House to present project concepts and information about the

study, which were also posted on the City's website for the remainder of the study. Notification postcards were mailed to all homeowners near proposed projects so they would be aware of the study recommendations. Partnership members paired with DPW staff at their own civic association meetings where proposals for local projects were explained. The presence of a neighborhood member who had worked with the City on the study recommendations proved invaluable. With the Partnership in attendance, the Mayor and Council adopted the Watts Branch Watershed Management Plan in 2001.

Watershed Study Methods

The Watts Branch Study uses the Rapid Watershed Planning Handbook (Center for Watershed Protection, 1998) methods to predict future watershed conditions based on impervious cover, set realistic and measurable goals, and assess whether improvements are working. This generates recommendations based on defensible science and measurement. It emphasizes local commitment by requiring community involvement and an implementation plan adequate to carry out the recommendations. Figure 2 illustrates milestones in the study.

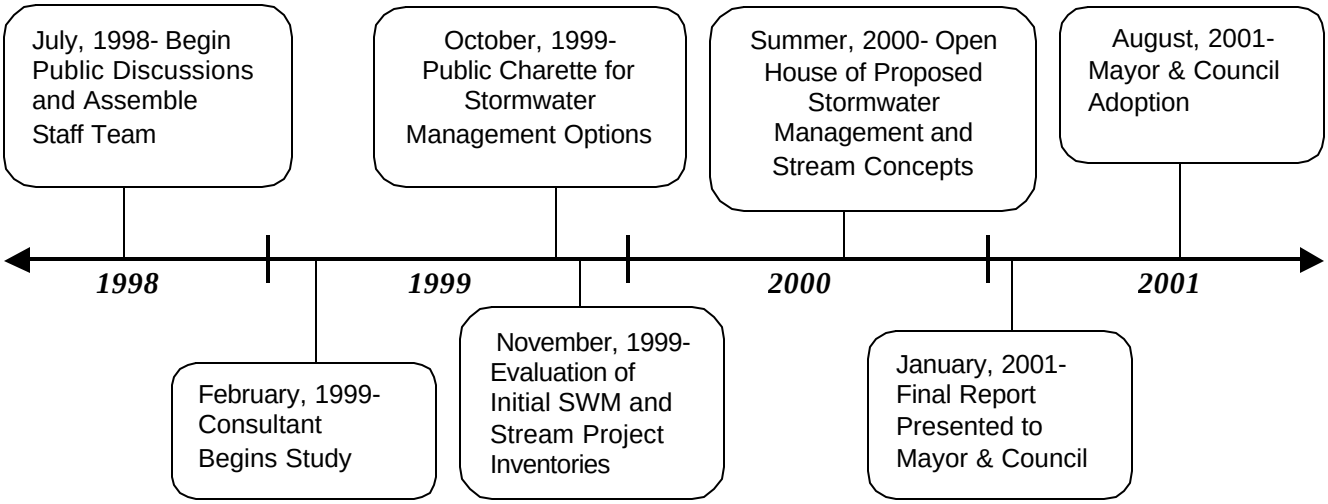

Figure 2. Watts Branch Watershed Study Timeline (Center for Watershed Protection and City of Rockville, 2001)

Phase I of the study consisted of the initial data gathering and analysis, leading to a list of needs and opportunities. Rockville was fortunate to have recent GIS-based topographic, property and utility information for the entire city, and 2' contour topography and tree surveys for almost all parks. The consultants did an RSAT (Rapid Stream Assessment Technique) survey of stream habitat and physical conditions at 400-foot intervals to assess the general health and level of erosion in Watts Branch and its tributaries (Galli, 1996). Potential and existing SWM facilities around the watershed were screened by drainage area and capacity, effectiveness and feasibility of modernization. They were field-checked to evaluate natural resource constraints and expansion concerns.

Data from a Rapid Geomorphic Assessment evaluated physical parameters related to channel widening, downcutting and accretion (Center for Watershed Protection and MacRae, 1999). Based on this data and historic cross-sections from the 1950s-1960s, a new technique developed by the Center for Watershed Protection was used to predict the ultimate size of the channel at various points. It correlated the pre-urbanization and current channel cross-sectional area to imperviousness changes in the sub-watersheds, then

predicts final stream sections for the built-out imperviousness after factoring in the stream's response time (Caraco, 2000). This was considered to be more accurate than short-term monitoring with bank pins.

After the staff and Partnership members evaluated and prioritized the Phase I results, a list emerged of the most promising SWM opportunities and the most significant reaches of stream erosion. Phase II produced a 30% engineering concept design for each of these projects. The SWM concepts provided basic hydrologic and sizing computations, a conceptual grading plan that included maintenance access and limits of disturbance, and a count of significant trees (>12" DBH) that would be removed by the proposed project. Stream concept plans showed proposed restoration techniques, including rock vanes, step pools, coir fiber logs, bank laybacks and planting, and imbricated rip-rap or gabions. Stream plans also showed the limits of disturbance for access paths, stockpiles, and construction to give the Partnership a better sense of whether the stabilization justified the disturbance and tree loss. On several projects, the consultants were asked for alternate SWM concepts to explore Partnership requests that would reduce tree loss or relocate the footprint.

During Phase II, the City met with representatives from Maryland Department of the Environment and the Army Corps of Engineers to consider wetland and waterway permitting issues. Their comments resulted in abandonment of one SWM concept and revisions to several others to better protect existing wetlands and maintain streams through the proposed ponds. The regulatory agencies were very supportive of the management plan's intent to mitigate a developed watershed, and helped identify permitting constraints and acceptable alternatives during the concept process. This is expected to facilitate the later project design stage when Section 401-404 permits will be sought.

Phase III focused on watershed-wide issues. Several Partnership meetings were devoted to discussing members' views on environmental education, watershed outreach and effective ways to change behavior in residents and businesses. The Center for Watershed Protection developed a schematic education/outreach approach based on research into other successful programs (Schueler, 2000a, 2000b). The Center also produced a map of wetland enhancement and forestation opportunity sites that staff will integrate either with specific stream restoration/SWM CIP projects or through developer obligations under the City's Forest Conservation and SWM ordinances. These and other non-structural watershed rehabilitation strategies will be implemented across Rockville in the next few years through the City's upcoming National Pollutant Discharge Elimination System – Phase II (NPDES-II) permit requirements.

Study Assumptions

City staff specified numerous study assumptions that shaped the solutions. The City Department of Parks provided parameters such as no net loss of active playing fields or other recreation features due to SWM or stream projects. The City Forester and Environmental Specialist specified access paths and helped characterize forest and wetland resources to avoid extensive impacts. For cost-effectiveness, DPW chose 25 acres as a desired minimum drainage area for retrofit consideration, although a few opportunities for small facilities were also evaluated. This limitation automatically reduced feasible SWM choices to various forms of ponds and marshes. Bioretention, surface sand filters and underground pipe storage become impractical with drainage areas larger than a few acres, although the City regularly uses these methods for smaller sites.

With erosion and riparian tree loss topping the list of community concerns, water quantity control became the most important SWM parameter to address on a comprehensive scale. Therefore, it was decided in consultation with the Center that the first priority would be to achieve 100% of the Channel Protection Volume (i.e., 1-year, 24-hour extended detention control) in a facility. This has been designated by the

State of Maryland as the most critical SWM control for preventing downstream erosion (Maryland Department of the Environment and CWP, 2000). Water quality treatment was also included to the maximum extent feasible. About half of the recommended SWM sites could accommodate 100% of the water quality volume for 0.5" of runoff over the watershed area, which was consistent with the City's water quality standards in 2000 and deemed reasonable for a retrofit situation (Center for Watershed Protection and City of Rockville, 2001). One inch of water quality treatment was not practical due to storage limitations.

Stream erosion problems were found in almost all tributaries and throughout the mainstem. To help prioritize these, DPW applied an existing City policy that limits use of City funds to improvements on City lands. From the City's perspective, these funds should be spent on repairs to the City's first responsibility, its own parks. For stream reaches owned by private homeowners' associations or residents, this assumption has caused problems. Even if erosion was significant on these reaches, the City's ranking system discounted the site, resulting in stream restoration recommendations only for publicly owned streams. The City is now debating whether this policy can be modified without incurring large and unplanned financial burdens.

The public process also operated under assumptions. First, staff believed that the Citizen Participation by Objectives methods would be effective in fostering cooperation and open exchange of ideas with residents, so that compromise would be achievable. This assumption was generally met, and resulted in high satisfaction with the study process from both Partnership and non-Partnership residents. Second, staff assumed that the civic and homeowners' associations were the main conduits to convey information between residents and the City. This tended to work well in active associations, but was ineffective at informing communities where neighborhood meetings were informal and infrequent. This gap was partially filled with the City's publicity and notification process through local mailings, papers, and City Cable TV shows.

Study Findings and Recommendations

At the end of Phase I, 54 SWM opportunities were considered in Partnership meetings from both the City's perspective (such as pollutant removal efficiency, capacity to control the drainage area, cost, access and maintenance burden) and from the community perspective (including appearance, safety concerns, impacts to trees and to recreation). Since these perspectives often worked at cross-purposes, staff chose a two-variable system to compare SWM projects. Each project received two scores that were plotted on an x-y coordinate system to graph the relative values of environmental management vs. community impacts. Scores reflected that a project could be neutral or negative in a category, as well as positive. Projects that scored well in both categories were agreed to be worthy of further investigation at the Phase II concept stage. A few projects that were highly rated in one category and had few negative effects in the other category also went to concept stage. This method simplified the comparisons while helping the Partnership visualize distinctions. In all, 18 SWM projects moved forward for Phase II concepts.

Similarly, 62 RSAT sample points, covering 4.7 stream miles, were culled through a ranking system based on severity and extent of erosion, land ownership and forest impacts. 2.7 miles of stream were selected as high priority restoration areas.

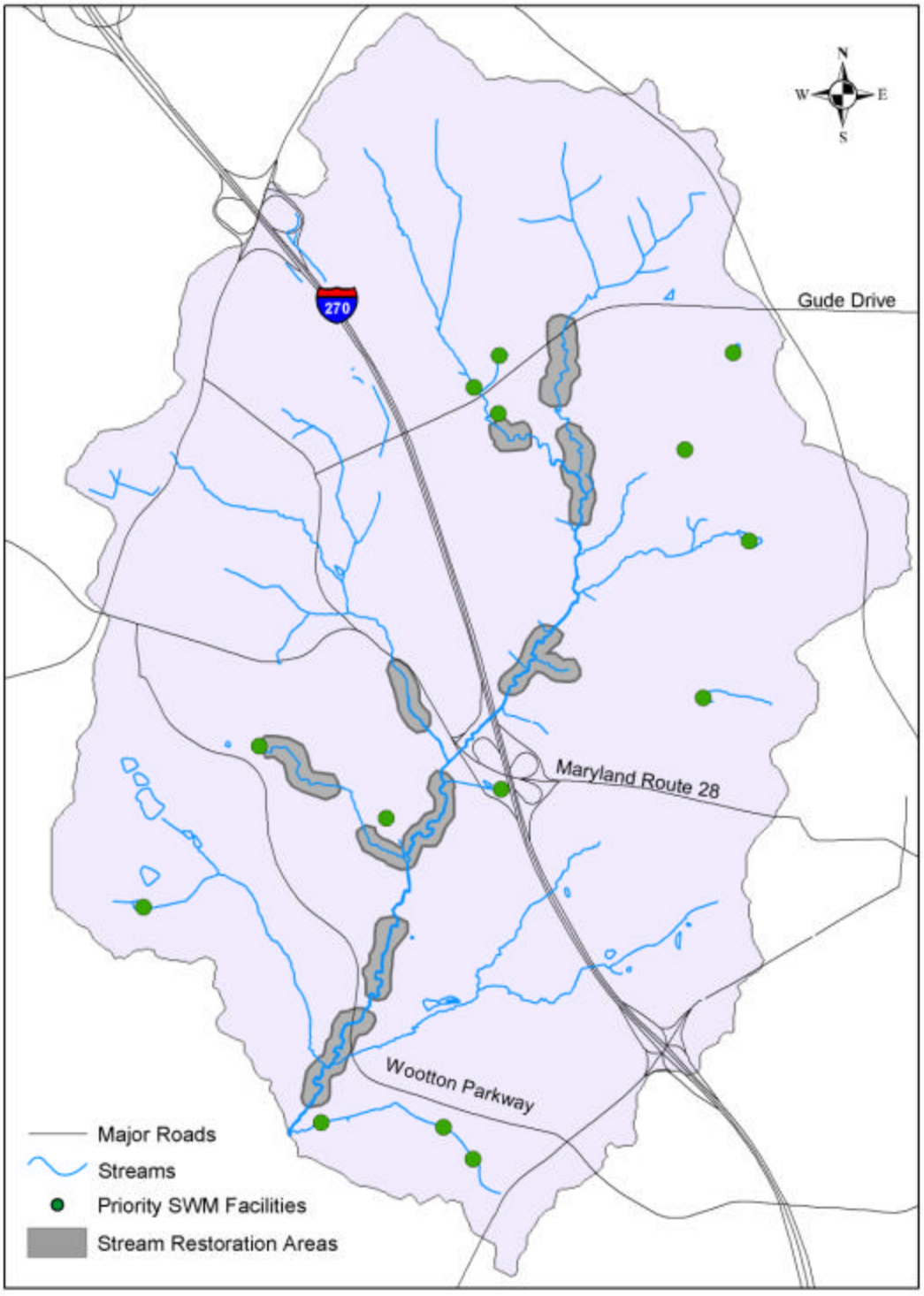

Figure 3. Adopted Watershed Projects in Watts Branch (Center for Watershed Protection and City of Rockville, 2001)

Some controversial projects moved forward to concept design. The Partnership members agreed that more information was needed before deciding whether these were viable or not. This aided the concept evaluation process at the end of Phase II, since the Partnership could then assess questionable projects with better information.

The City and the Partnership had to balance the impacts of projects against the threat of doing nothing. The Rapid Geomorphic Assessment projections showed that, as a whole, Watts Branch stream cross-sectional area may expand to two to four times its existing size over the next 40-50 years as it adjusts to a new state of equilibrium with the watershed's built-out impervious condition (Center for Watershed Protection and City of Rockville, 2001). This would lead to continued extensive undermining and toppling of large trees along most of the stream valley, add more sediment to the stream system, and degraded the biological activity of the fish and macroinvertebrate populations throughout Watts Branch. Given that the community was clamoring for the City to do something about sediment-laden streams and undermined trees at the start of the study, it became clear to the Partnership that the null alternative would not serve the goals. This made it easier for the Partnership to defend the inevitable tree loss, construction impacts and SWM facility changes they needed to endorse, and helped the members move onto seeking realistic ways to minimize these impacts rather than declare them unacceptable.

The projects adopted in the management plan are shown in Figure 3. The Watts Branch Management Plan established fourteen SWM retrofit projects covering 925 acres of untreated or under-treated development (roughly 25% of the total watershed), of which eleven would be public facilities. The plan provides four new SWM facilities and ten modernizations to existing SWM ponds, as well as nine separate stream restoration projects. Combined with new SWM systems for 700 additional acres of mixed-use development in the Watts Branch headwaters, this represents effective management of a substantial portion of a built-out watershed. Over 50% of the watershed will be treated by modern SWM controls of 1-year, 24-hour extended detention and quality treatment of at least 0.5" runoff.

Problem Projects

Not all projects evaluated in Phase II survived in the final recommendations. In following the Citizen Participation by Objectives method, staff dropped environmentally valuable projects that might create more neighborhood problems than they would solve, such as on a potential pond site that would clear a 200 foot wooded buffer between houses and an interstate highway. Technically, the facility would work; the noise and visual impacts to the houses facing the site were estimated by City staff to be insurmountable and could not be adequately mitigated without the State Highway Administration's commitment to a noise wall. The City maintained credibility by showing that the watershed goals were based not only on environmental benefits but community benefits as well.

Knowing neighborhood history helped the staff and consultant avoid unnecessary impacts. For example, the study recommended a new wet pond at a park site that was just receiving a new playground through the efforts of the Parks Department and a local Girl Scout troop. The proposed pond would necessitate relocation of the playground. DPW decided to schedule the pond project later in the CIP to coincide with the expected lifespan of the playground. This would give the community ten years to enjoy their playground and agree on a satisfactory new location in the same park for the next set of play equipment.

As expected, the most controversial projects were proposals for new ponds in active parks. The College Gardens Park pond produced a long stalemate between the staff and a neighborhood civic association. This

project called for the expansion of a small farm pond to almost three times its current size in a heavily used urban park. This project was popular with the staff and the Partnership because it was fairly neutral in community impacts while providing exceptional water quality and quantity benefits for an 89-acre mixed-use watershed. Although the expansion would remove grassed playing area, all other recreation features and trails could be retained or relocated.

Several residents, including the civic association president, were polarized against any changes to this park, and demanded more 'innovative' alternatives be investigated, including underground SWM proprietary measures and moving the pond downstream into a wooded stream valley. Community opposition materialized with the first presentation to the civic association and took fourteen months and eight formal meetings with association representatives before the Watts Branch management plan was finally adopted. Some of the difficulty came from issues of control as people who were not involved in the Partnership tried to negotiate separate oversight of the study.

To counter this, the City followed the original methods of Citizen Participation by Objectives, reiterating the history of the public process. The City also pointed out that several association members had, in fact, been on the Partnership since the beginning, including the association's president at the start of the Watts Branch study. DPW also obtained a lengthy alternatives analysis from our consultant in the final months of the study that investigated the association's requests and demonstrated that there were high costs for proprietary treatment and wetland/stream impacts for the in-line alternative that proved unacceptable to the state and federal regulatory authorities.

The project was conditionally recommended in the management plan after an extensive section on benefits and concerns describing the civic association's issues. At the request of the Mayor and Council, a further alternatives analysis will be completed before selecting a final design. Since traditional SWM approaches have already been investigated, staff will use this required evaluation to look at feasibility and implementation of concepts that were previously outside of the Watts Branch watershed study assumptions. The alternatives analysis will compare expected benefits and disadvantages from a watershed education/behavior modification program for residents, businesses and institutions in this community, a small-scale SWM retrofit program focusing on the high-impervious non-residential uses (about 30% of the watershed), the management plan's recommended central SWM facility, and stream restoration/storm drain outfall stabilization. DPW hopes this will help clarify the pros and the cons of each choice to find a solution that has both reasonable environmental benefits and acceptable public understanding and support. Staff expects the civic association to be an active participant in this follow-up analysis, much as the Partnership was for the Watts Branch study. This investigation will also assist DPW in testing approaches for the NPDES-II requirements.

Post-Study Evaluation of the Public Process

The Partnership's two and a half year review period left enough time for watershed education and gathering feedback from the participating neighborhoods. Residents were welcome at any time to start attending meetings, and several active Partnership members joined at the Phase II concept stage. Staff had more difficulty explaining the study's background, scientific basis and findings to non-Partnership residents & civic associations in the space of only a few meetings. Most associations and residents were able to appreciate the validity of the recommendations and agreed to support their local projects. One neighborhood did not participate at all in public meetings or the Partnership, then protested the proposed

project during the last few months before adoption. The City will need to work closely with these residents when the design stage begins, since they have no previous commitment through the watershed study.

The Partnership members delivered a statement at the final plan's introduction to the Mayor and Council regarding their support of the management plan process and recommendations. Not all controversy could be avoided. The Mayor and Council heard opposing views during the eight months between introduction and adoption of the management plan, but still believed that staff had been fair and objective in making the recommendations. The fact that only two of the recommended projects drew any negative comments showed that there was general satisfaction among the stakeholders. Many residents commented that the projects showed an awareness of collateral neighborhood issues and preserved features important to them.

A year after the Watts Branch Watershed Management Plan was adopted, the Partnership members received a survey from the City asking for their opinions on the effectiveness of the study process, their satisfaction with the study's methods and recommendations, and their viewpoint on whether their involvement made a difference. The responders were extremely pleased with the staff's cooperative efforts and the public process, citing it as much improved over previous City projects and an example of how government should work. They recommended that this process be used for other controversial projects. Although some members felt that solution options were too limited, they agreed that the City had made a valid effort to explore alternate ideas and the final recommendations were compatible with their neighborhood needs. They also liked that SWM and stream concepts had been revised to incorporate most of their project-specific comments.

The public process led to compromise on both parts, a willingness to explore alternatives, and acknowledgement that not every problem could be solved. Once the members could tie watershed goals to community goals, or at least balance conflicts between them, many watershed projects became palatable. In general, residents are much less fearful of the short-term impacts and long-term effects on their quality of life. The study built credibility and support within the neighborhoods that will be essential as DPW continues to work with the residents during design and construction.

Implementation - From Paper to Ponds

A watershed management plan will succeed only if it is implemented. In the past decade, DPW has built at least ten stormwater management retrofit and five stream restoration projects from its watershed studies. Watts Branch Plan projects on City parkland are proceeding through design and construction in the City's CIP over a 10-year period. Non-City projects are also advancing through other mechanisms, such as a low-cost retrofit of a State Highway Administration dry pond in an Interstate-270 interchange that is being designed and constructed through the Recreation and Parks Department to fulfill its SWM obligation for a new bike trail. Through private development, dozens of other SWM and stream projects are built and then turned over to the City to maintain. Although Rockville has had its share of planned SWM projects that were never built due to changing wetland standards, land constraints or public outcry, the City's long-term implementation rate is impressive.

Watershed plans are dynamic documents. They guide CIP planning, but DPW also forwards the watershed goals through cooperative planning with developers and teaming projects that need more immediate attention. The City's watershed management strategy continues to include a bigger toolbox of private/non-parks opportunities. Given Rockville's built-out condition, equivalent SWM alternatives such as stream restoration or stabilization, retrofit of an existing but outdated SWM facility, or control of a different piece

of imperviousness on the site (parking lot instead of rooftop) may offer more environmental benefit than a traditional onsite SWM system. Regular performance monitoring and stream surveys are still needed to identify the solutions that work and the needs that remain. DPW expects to revisit each watershed management plan every ten years to evaluate its progress.

The public process continues through the final design and construction phases for individual projects. Projects in parks or near residences are heavily publicized. Several meetings are held at various points to get feedback on design details and neighborhood concerns. DPW, the Project Implementation Coordinator and other staff make sure residents have access to information. Good groundwork at the management plan level helps to prepare communities for upcoming changes.

The City's dedicated SWM Fund makes the watershed management program self-supporting (Table 3). Money is primarily collected from monetary contributions collected in lieu of on-site SWM from projects too small to support their own facilities and, to a lesser extent, from developers' SWM and sediment control permit fees. The fund supports the operating budget expenditures for maintenance on City-owned SWM facilities and for DPW staff who review or inspect SWM and sediment control in both private development and the City's CIP. The fund also covers design and construction of public SWM facilities and stream restoration, watershed studies, policy planning, and some additional programs that will be needed for the City's upcoming NPDES-II permit.

The estimated design and construction cost for all of the Watts Branch Management Plan projects is a total of $2.8 million. Based on a 2000 fiscal analysis, the fund should manage expected costs for the foreseeable future, including full funding of projects from all three watershed management plans. However, as development slows with the City's near build-out, a SWM utility fee for residential and business owners may become necessary. DPW also solicits and receives limited State grant funding for design and construction of SWM and stream restoration projects.

Table 3. City Stormwater Management Fund

Stormwater Management Fund	
Unreserved Fund Balance (FY2002)	$5.2 million
Monies Earned (FY97-2000)*	$963,000/year
Operating Expenses (FY97-2000)*	$290,000/year
Capital Expenses (FY1997-2000)*	$550,000/year

City of Rockville Department of Finance, 2002
*Note: Average taken over 4 years for better picture of income and expenditures over time.

Conclusion

Rockville's watershed management plans have benefited from a dedicated funding source, a compact and flexible city government, a strong development community, a spirit of teamwork among City staff, and resident interest in streams and parklands that is reflected by the Mayor and City Council. Problems and priorities change, so these plans only capture a snapshot in time of watershed conditions. Therefore, DPW will continue to advance effective and innovative watershed stream protection with a variety of strategies. In watershed management, everything is an opportunity.

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